

REMARKS

This paper is presented as a supplemental reply to the final official action dated August 12, 2008, which rejected all of the examined claims as being obvious over the "combined teachings of AAPA (Applicants' Admitted Prior Art) and DE 1643724 and optionally DE 1619940 (Both Cited by Applicant)." The applicants filed a reply (entitled "Amendment 'B' and Response to Final Official Action") to that action on October 8, 2008, in which they sought to amend certain claims and traversed the rejection. In an advisory action dated October 24, 2008, the Patent Office refused to enter the amendments, stating that the amendments (a) raise new issues that would require further consideration and/or search, and (b) are not deemed to place the application in better form for appeal. Accordingly, this paper is presented concurrently with a request for continued examination under 37 CFR § 1.114, respectfully requesting that the Patent Office enter the amendments presented in the applicants' October 8 reply, consider the amendments and comments presented herein, and reconsider and withdraw the outstanding rejection.

Amendment "B" referred to Appendices "A" and "B," but it appears the appendices may not have been transmitted to the Patent Office. Those appendices are presented herein. Appendix "A" is a copy of U.S. Patent No. 3,804,915 (to Schmid et al.), and Appendix "B" is a copy of U.S. Patent No. 3,469,369 (to Helmke).

Each of independent claims 1 and 40 has been amended to specify that the process steps recited therein are performed "simultaneously." Written description support for the amendment to each claim can be found in the specification at, for example, page 13, lines 3-15, which describes an embodiment of the process with reference to Figure 1, and page 15, line 8, to page 16, line 4, which describes an embodiment of the process during start-up with reference to Figs. 2a-2d. In these embodiments, the process steps occur simultaneously. Written description support for the amendment can also be found in the disclosed Example, which describes an 8-hour run wherein a slurry and a displacement fluid are each fed at a different, but constant flow rates. *Id.* at p. 17.

In their October 8 reply, the applicants attempted to more clearly recite in independent claim 1 that the filtration zone is defined by higher and lower concentration zones separated from one another by a filter. According to the advisory action, however, the applicants' attempted clarification "could serve as a definition for a 'filter,'" and that the definition is "seen to add no meaningful (i.e., patentable) limitation to the claim." The applicants respectfully submit that the attempted clarification is pertinent to subsequent recitations in claim 1 that both a slurry feed and a displacement fluid flow—*countercurrently* to one another—into the higher concentration zone. The zones are thus recited to provide

proper antecedent basis for other recitations in the claim, and the filter is recited to delineate the two zones. The applicants respectfully submit that none of the applied prior art describes flowing a slurry feed and displacement fluid into a higher concentration zone of a filtration apparatus *countercurrent* to one another.

The Schmid patent teaches the ordinarily skilled artisan to employ an inert medium to remove any mother liquor (and impurities therein) adhering to p-xylene crystals present in a filter cake by passing the inert medium through the filter cake. More specifically, the filter cake is produced by crystallizing p-xylene out of a C₈ aromatic mixture at low temperatures and subsequently filtering the mother liquor from the crystals. The produced filter cake is then purified by passing an inert medium through the filter cake. See the Schmid patent at col. 1, line 72, to col. 2, line 7. Thus, the Schmid patent requires two separate and distinct steps to obtain a purified p-xylene: (a) filtration to separate liquid from the solid crystals, and (b) passing an inert medium through the filter cake to dislodge any liquid that may adhere to the solid crystals.

These teachings in the Schmid patent, however, are neither the same as nor do they otherwise suggest flowing a slurry feed and a displacement fluid—countercurrently to one another—into the recited higher concentration zone. Specifically, the Schmid patent contains no disclosure that the inert medium flows countercurrent to the flow of any slurry feed—and the applicants respectfully submit that the inert medium does not flow in that manner. Furthermore, the Schmid patent contains no disclosure that the inert medium and slurry feed even flow simultaneously—and the applicants respectfully submit that they do not flow simultaneously. Instead, the applicants respectfully submit, that the slurry feed flows in the direction of a filter to form a filter cake on a side of the filter. And, following any steps performed to increase the density of the filter cake, see the Schmid patent at col. 2, lines 53-61, the inert medium flows in the *same*—not opposite—direction in which the slurry feed previously flowed.

The advisory action submits that "countercurrent" flow of a displacement fluid and slurry feed are shown in Figure 2 of the Helmke patent. See the Action at 4 (identifying gas pressure line 1 for flow "A" and a fluid inlet 11 for flow "B"). The applicants respectfully submit that this arrangement does not demonstrate countercurrent flow, much less the countercurrent flow recited in the rejected claims.

As argued below, the Figure 2 of the Helmke patent does not depict or suggest countercurrent flow. Even if, however, the flows depicted in Figure 2 of the Helmke patent could somehow be considered as countercurrent, there is still no disclosure in the Helmke patent that teaches or otherwise suggests the flows occur simultaneously. To the contrary, the Helmke patent teaches that the flows occur separately and consecutively. Specifically,

the Helmke patent teaches the separate and consecutive steps of: (a) introducing a filterable resin mixture into a pressure chamber 3 containing a filter 19; (b) exhausting a bell jar 22 disposed downstream of the filter 19; and, thereafter (c) applying or flowing air or suitable inert gas into the pressure chamber 3 sufficient to force heated epoxy through the filter 19:

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lamp (not shown). Heating speeds up the filtration of stable high viscosity fluids, as is well known.

In a typical application of the inventive method for filtering an epoxy resin, a filter of 0.1 micron absolute pore size is used. The resin is introduced into the pressure chamber 3 and the filter assembly temperature is raised to within a range typically of 50-69° C., the specific range set by the heat dependence of the polymerization of the epoxy. 5

Next, the bell jar is exhausted by a trapped mechanical vacuum pump, for example, to a vacuum of better than 10 mm. of mercury. The pumping also equally exhausts the air from the filter assembly and filter membrane but is insufficient to draw the fluid therethrough. Thereafter, an air or suitable inert gas pressure sufficient to force 15 the heated epoxy through the filter membrane is applied. The epoxy settled in the bell jar is outgassed for a period averaging five to ten minutes.

The '369 patent at col. 3, lines 3-18. No other embodiments are described in the Helmke patent. And, although the Helmke patent suggests that the disclosed embodiments merely illustrate the objects of the invention disclosed therein—namely, outgassing a filter prior to passing a pressurized fluid through the filter and to its point of use to avoid contamination of the filtered fluid—those objects are not implicated by the process recited in the rejected claims. Consequently, the applicants respectfully submit that a person having ordinary skill in the art would not consider the disclosure in the Helmke patent as indicative or otherwise suggestive of *simultaneous* flows of a filterable slurry and a displacement gas *countercurrent* to one another.

The advisory action complains that the applicants' arguments "disavow any knowledge of the prior art that the hypothetical skilled artisan may have." The applicants disagree. The hypothetical person having ordinary skill in the art understands the term *countercurrent* to have a precise meaning that does not encompass the Patent Office's interpretation of Flows "A" and "B" depicted in Figure 2 of the Helmke reference or otherwise described therein. As argued above, those flows occur consecutively, not simultaneously. Consequently, flow "A" does not occur counter to the current of flow "B." And, similarly, flow "B" does not occur counter to the current of flow "A."

Moreover, *countercurrent* flow is a term well known to refer to flow of materials in opposite directions:

Time)
1 counter-current \ˈkaʊntə(r)- + \ n [counter- + current
(n.)] : a current flowing in a direction opposite to that of
another one (an oceanic ~)
2 countercurrent \ˈkaʊntə(r)- + \ adj [counter- + current (adj.)]
1 : flowing in an opposite direction 2 : involving flow of
materials in opposite directions (acetylene dissolved by ~
treatment with water)
3 countercurrent \ˈkaʊntə(r)- + \ or coun-ter-currently \ˈkaʊntə(r)- + \ adv
: in a direction opposite to that in which something else is
flowing (a gas passed ~ to a fluid running through a tube)
coun-ter-cyclical \ˈkaʊntə(r)- + \ adj [counter- + cyclical]
: calculated to check excessive developments

WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY, 519 (2002). Furthermore, the term is well known in the chemical engineering art to refer to fluids that flow or pass in opposite directions:

Countercurrent and parallel-current flows The two fluids enter at different ends of the exchanger shown in Fig. 11-3 and pass in opposite directions through the unit. This type of flow is that commonly used and is called *countercurrent* or *countercurrent flow*. The temperature-length curves for this case are shown in Fig. 11-4a. The four terminal temperatures are denoted as follows:

Temperature of entering hot fluid, T_{h0}
Temperature of leaving hot fluid, T_{h1}
Temperature of entering cold fluid, T_{c0}
Temperature of leaving cold fluid, T_{c1}

The approaches are

$$T_{h0} - T_{c1} = \Delta T_2 \quad \text{and} \quad T_{h1} - T_{c0} = \Delta T_1 \quad (11-1)$$

The warm-fluid and cold-fluid ranges are $T_{h0} - T_{h1}$ and $T_{c1} - T_{c0}$, respectively.

If the two fluids enter at the same end of the exchanger and flow in the same direction to the other end, the flow is called *parallel*. The temperature-length curves

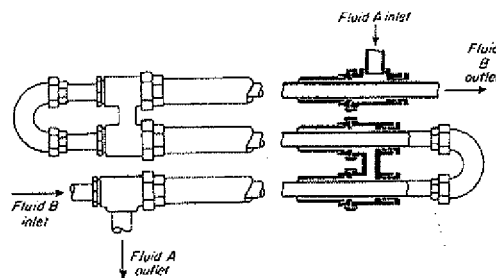


Figure 11-3 Double-pipe heat exchanger.

WARREN L. MCCABE ET AL., UNIT OPERATIONS OF CHEMICAL ENGINEERING, 277 (McGraw-Hill Publishing Company, 1984); see also, HAWLEY'S CONDENSED CHEMICAL DICTIONARY, 307 (13th Ed., Van Nostrand Reinhold, 1997); (defining "countercurrent" as a term descriptive of a process in which a liquid and a vapor stream, or two streams of immiscible liquids, or a liquid and a solid are caused to flow in opposite directions ...). More complete copies of these three publications appended to this paper (in Appendix "C") for the convenience of the Patent Office.

The applicants respectfully submit that, in Figure 2 of the Helmke patent, flows the Patent Office identified as "A" and "B" are not in "opposite" directions relative to one another. Instead, those flows occur in the *same* direction because both of the gas in line 1 (flow "A") and the fluid in line 11 (flow "B") travel in the *same* downward direction through the pressure chamber 3, filter 19, duct 16, jar 22, and bottom neck 24. The Patent Office has identified no

support for its position that the Helmke patent describes countercurrent flow. From the vantage point of a hypothetical ordinarily skilled artisan, having knowledge of this well-known term, the applicants respectfully submit that the Helmke patent does not disclose countercurrent flow.

In view of the foregoing, the applicants respectfully request entry of the amendments to claims 1 and 40, reconsideration and withdrawal of the rejections, reconsideration of the arguments presented in the applicants' October 8 reply, and allowance of all of the pending claims.

Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to contact the undersigned attorney.

Respectfully submitted,

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November 12, 2008

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